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From: Li, Yong -NRR
To: Khanna, Meena
Cc: Manoly, Kamal
Subject: My updated input to AIT on seismic instrumentation
Date: Monday, September 19, 2011 11:35:03 PM

This covers all the issues at the plant and also potential generic issue too.

-----Original Message-----
From: Khanna, Meena
Sent: Friday, September 16, 2011 5:47 PM
To: Decker, David
Cc: Li, Yong; Manoly, Kamal
Subject: RE: Follow-Up Question from Congressional Staffer

Hi David, here is a response to the question from the Congressional Staffer:

From the performance comparison of two types of seismometers (Engdahl vs. Kinemetrics) installed at the plant, the Kinemetrics type of seismometers are more reliable because they recorded the time history when the ground motion exceeded 0.01g. Engdahl scratch plates only recorded peak values and they did not register any motions at some frequencies. The Kinemetrics seismometer recordings were processed and calculated by the vendor and were compared to the corresponding design of structures to determine whether the recorded motion has exceeded the seismic design at certain elevations within the structures of interest. Based on the walkdowns and inspections carried out, thus far, by Dominion, the earthquake damage intensity was determined to be about 0, according to the EPRI "Seismic Damage Scale," which was endorsed by the NRC in Regulatory Guides 1.166 and 1.167.

Thanks,
Meena

-----Original Message-----
From: Decker, David
Sent: Friday, September 16, 2011 11:34 AM
To: Khanna, Meena
Cc: Li, Yong; Manoly, Kamal
Subject: RE: Follow-Up Question from Congressional Staffer

Meena,
I sent the staffer the updated info you sent to me below, and here is a follow-up e-mail from her about the seismic measuring equipment at North Anna. Hopefully the USGS statement about better equipment being available was talking about the kinematic equipment, but I wanted to check. Also, is there anything we can say about how confident we are about the readings, as the staffer is worried about? Thanks. -David

Follow-Up E-mail
Thanks for the info, but I'm still a bit confused. Is the kinemetric equipment the type of equipment USGS is recommending? The witness made it sound like there was better equipment that wasn't being used yet in plants. Also, if the two types of equipment didn't provide the same readings, how do we know which is/or if either is correct? Could the earthquake have been worse than Dominion thought because their equipment didn't record it properly?

-----Original Message-----
From: Khanna, Meena
Sent: Thursday, September 15, 2011 10:50 PM
To: Decker, David
Cc: Li, Yong; Manoly, Kamal
Subject: FW: Follow-Up Question from Congressional Staffer
Importance: High

D/3

David, pls use this response in lieu of what I sent you earlier..thanks

Kinemetrics seismometers are relatively reliable because they provide ground motion time histories and the corresponding response spectrum can be calculated. However, Engdahl Scratch plates only record peak accelerations and due to unknown reasons, the scratch plates at the North Anna plant did not register any ground motion from the earthquake at certain frequencies. The response spectra from Engdahl and Kinemetrics seismometers showed significant inconsistency, in both frequencies and amplitudes, eventhough the two seimometers are located at the same location/elevation. However, it should be noted that both types of recordings indicated the exceedance of OBE and DBE at the North Anna site.

From: Khanna, Meena
Sent: Thursday, September 15, 2011 6:35 PM
To: Decker, David
Cc: Manoly, Kamal; Li, Yong; Wilson, George
Subject: FW: Follow-Up Question from Congressional Staffer

David, here is a response to your question...

Yes, Kinemetric recordings are more reliable because they provide time histories and the corresponding response spectra can be calculated. Engdahl Scratch plates only record peak accelerations and could miss accelerations at certain frequencies, thus, one would be expected to see some inconsistency in reflecting the frequency vs. amplitude of vibrations. However, it should be noted that both types of recordings indicate the exceedance of OBE and DBE at North Anna.

Thanks,
Meena

From: Decker, David
To: Munson, Clifford
Cc: Wilson, George
Sent: Thu Sep 15 09:55:48 2011
Subject: RE: Follow-Up Question from Congressional Staffer
Thanks Cliff. Knowing that we also have data from seismometers (do we know how many there are at the plant) is good.

George – anything more that we can say about where we got data to evaluate the eartquake's impact (other than the scratchplates) would be much appreciated.

From: Munson, Clifford
Sent: Thursday, September 15, 2011 8:01 AM
To: Decker, David
Cc: Wilson, George
Subject: RE: Follow-Up Question from Congressional Staffer

Bill Leith of USGS was referring to the "scratch plate" readouts. Dominion also has seismometers which give a complete record of the earthquake motions so they aren't just relying on the scratch plates, which are fairly crude (1970s technology).

Maybe George Wilson can amplify more on the accuracy of the scratch plates since he has experience with them.

Cliff

From: Decker, David
Sent: Wednesday, September 14, 2011 5:25 PM
To: Wilson, George; Munson, Clifford; Croteau, Rick; Jones, William
Subject: Follow-Up Question from Congressional Staffer

We received the following question from Kathy Dedrick (one of our Senate oversight staffers who we've talked with on the phone twice recently), after she watched the Task Force public meeting today. Thanks for your help in responding to the question below. -David

"Can anyone explain to me what the ramifications are of the USGS testimony today which said that the measurements at North Anna were probably not accurate within 10 or 20 percent. Does that mean they are less sensitive and the ground motion could have been much more? Or what does that mean? It sounds like those instruments are the only source of information, so Dominion would be basing decisions on something that isn't very accurate."